

Building optimised domes without formwork

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Abstract Our research on domes and vaulted structures aims to revive and integrate in the 21st century the techniques used in past centuries and millennia, such as those developed in Egypt or during the period of gothic architecture in Europe.

This R&D seeks to optimize the structures by increasing the span of the roof, decreasing its thickness, and creating new shapes. Note that domes and vaulted structures are normally built with compressed stabilised earth blocks, which are laid in “free spanning” mode (without formwork), which has been developed by the Auroville Earth Institute. This technique is a development of the Nubian technique.

The stability method developed at the Auroville Earth Institute optimises arches, vaults and domes, especially the profile and thickness, so as to get the lightest structure for the widest span.

The stability of domes is derived from the stability of a vault of the same section than the dome.

Keywords Stability study – Free spanning technique – Compressed stabilised earth blocks